

alternatives, modifications, and variations will be apparent to those skilled in the art in light of the foregoing teachings. Accordingly, the invention is intended to embrace all such alternatives, modifications and variations as fall within the spirit and scope of the appended claims.

What is claimed:

1. A pneumatic radial ply runflat tire having a tread (48); two sidewalls (43,45,70,90); a carcass comprising an outer radial carcass ply (57,77,97), two bead regions (56a,56b,76b,93b) each containing an inextensible annular bead (49a,49b,96b), a two-part discontinuous ply (52,72,92b) with one portion (52a,52b,72b,92b) contained in each sidewall and disposed between two wedge inserts (58a/59a, 58b/59b, 78b/79b, 98b/99b); and one or more belts located between the tread and the outer radial carcass ply, the tire being characterized in that:

each of the two portions (52a,52b,72b,92b) of the two-part discontinuous ply is made from two layers (64,66) of cross-biased fabric;

each of the cross-biased fabric layers is made of parallel-aligned cords (65,67);

the parallel-aligned cords of a first fabric layer (64) are oriented at an angle with respect to the radial direction that is approximately equal in magnitude but opposite in direction to the parallel-aligned cords of a second fabric layer (66) of the two layers of cross-biased fabric; and

the parallel-aligned cords of the respective fabric layers are oriented at angles of between 40 degrees and 65 degrees with respect to the radial direction.

2. The tire of claim 1 characterized in that:

the parallel-aligned cords (65,67) of the respective fabric layers (64,66) are preferably oriented at angles of

between about 45 and 55 degrees with respect to the radial direction.

3. The tire of claim 1 characterized in that:

the parallel-aligned cords (65,67) of the respective fabric layers (64,66) are made of materials from the class of materials that includes nylon and rayon.

4. The tire of claim 1 characterized in that:

turn-up ends (97b) of the outer radial carcass ply (97) are substantially contiguous with the main structural portion of the outer radial carcass ply.

5. The tire of claim 4 characterized in that:

the free ends (101b) of the ply turn up ends (97b) extend from above the corresponding bead (96b) upward to the mid-height of the sidewall (90).

6. A pneumatic radial ply runflat tire having a tread (48); two sidewalls (43,45,70,90); a carcass comprising an outer radial carcass ply (57,77,97), two bead regions (56a,56b,76b,93b) each containing an inextensible annular bead (49a,49b,96b), a two-part discontinuous ply (52,72,92b) with one portion (52a,52b,72b,92b) contained in each sidewall and disposed between two wedge inserts (58a/59a, 58b/59b, 78b/79b, 98b/99b); and one or more belts located between the tread and the outer radial carcass ply, the tire being characterized in that:

each of the two portions (52a,52b,72b,92b) of the two-part discontinuous ply is made from one or more layers (80) of parallel cords (81) which are wavy with respect to the radial direction.

7. The tire of claim 6, characterized in that:

the parallel cords (81) of each of the one or more layers (80) are defined by angles γ and θ that are between 50 degrees and 100 degrees.

8. The tire of claim 6, characterized in that:

the parallel cords (81) are made of metal.

9. The tire of claim 8, characterized in that:
the parallel cords (81) are made of steel.

10. The tire of claim 6, characterized in that:
the parallel cords (81) are made of fabric.

11. The tire of claim 6 characterized in that:
turn-up ends (97b) of the outer radial carcass ply (97)
are substantially contiguous with the main structural portion
of the outer radial carcass ply.

12. The tire of claim 11 characterized in that:
the free ends (101b) of the ply turn up ends (97b) extend
from above the corresponding bead (96b) upward to the mid-
height of the sidewall (90).

13. A pneumatic radial ply runflat tire having a tread
(48); two sidewalls (43,45,70,90) with shoulders
(54a,54b,74b); a carcass comprising one or more outer radial
carcass plies (57,77,97), two bead regions (56a,56b,76b,93b)
each containing an inextensible annular bead (49a,49b,96b), an
innerliner (44) a two-part discontinuous ply (52,72,92b) with
one portion (52a,52b,72b,92b) contained in each sidewall and
disposed between two wedge inserts (58a/59a, 58b/59b, 78b/79b,
98b/99b) of substantially equal flexibility; and one or more
belts located between the tread and the outer radial carcass
ply, the tire being characterized in that:

each combination of two wedge inserts with the portion of
the two-part discontinuous ply is in a sidewall flex area
located axially between the one or more outer radial carcass
plies and the innerliner, and extending radially approximately
from a location (55a,55b,75b) near the bead region
(56a,56b,76b) to an approximate location (53a,53b,73b) near
the shoulder (54a,54b,74b).

14. The tire of claim 13 characterized in that:

each of the two portions (52a,52b,72b,92b) of the two-
part discontinuous ply is made from two layers (64,66) of
cross-biased fabric;

each of the cross-biased fabric layers is made of parallel-aligned cords (65,67); and

the parallel-aligned cords of a first fabric layer (64) are oriented at an angle with respect to the radial direction that is approximately equal in magnitude but opposite in direction to the parallel-aligned cords of a second fabric layer (66) of the two layers of cross-biased fabric.

15. The tire of claim 14 characterized in that:

the parallel-aligned cords of the respective fabric layers are oriented at angles of between 40 degrees and 65 degrees with respect to the radial direction.

16. The tire of claim 14 characterized in that:

the parallel-aligned cords (65,67) of the respective fabric layers (64,66) are preferably oriented at angles of between about 45 and 55 degrees with respect to the radial direction.

17. The tire of claim 14 characterized in that:

the parallel-aligned cords (65,67) of the respective fabric layers (64,66) are made of materials from the class of materials that includes nylon and rayon.

18. The tire of claim 13 characterized in that:

each of the two portions (52a,52b,72b,92b) of the two-part discontinuous ply is made from one or more layers (80) of parallel cords (81) which are wavy with respect to the radial direction such that the parallel cords of each of the one or more layers are defined by angles γ and θ that are between 50 degrees and 100 degrees.

19. The tire of claim 18, characterized in that:

the parallel cords (81) are made of metal.

20. The tire of claim 13 characterized in that:

turn-up ends (97b) of the outer radial carcass ply (97) are substantially contiguous with the main structural portion of the outer radial carcass ply; and

the free ends (101b) of the ply turn up ends (97b) extend

from above the corresponding bead (96b) upward to the mid-height of the sidewall (90).